

## ***The Vegetation of the Chatham-Islands* by Ferdinand Mueller (1864): An Appreciation**

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### *Abstract*

Mueller's *Vegetation of the Chatham-Islands* is reviewed in late 20th Century terms for its contribution to taxonomic botany in New Zealand and, despite some criticism at the turn of this century, is not found deficient in its treatment. It was unlike Hooker's contemporary flora and difficult in its diction, and apart from essential taxonomic and nomenclatural uses, has not earned any significant reputation for its intrinsic merits.

### **Introduction**

In 1864 Ferdinand Mueller F.R.S. published his sole essay into the Flora of New Zealand in *The Vegetation of the Chatham-Islands*; John Ferres, Government Printer, Melbourne, was as usual his printer. Mueller, on the title page, appropriately used the expression "sketched by" for he had not visited the Chatham Islands (44°S, 176°W), but wrote from collections made in 1863 by H.H. Travers, who at his father's (W.T.L. Travers) instruction and personal expense spent six months on the Islands to examine their botany, ornithology, and anthropology (Travers, H.H. 1869; Travers, W.T.L. 1872). Although some earlier collections by Dr E. Dieffenbach and Captain Anderson were available, the specimens of H.H. Travers at Mueller's disposal, numbering perhaps one hundred ferns and higher plants (N.G. Walsh *in litt.*), were his chief source of information of a flora largely unknown at the time.

There was no discussion or criticism of Mueller's *Vegetation* until the early 20th century although there was dissatisfaction over his failure to add to it the results of a second collecting expedition in 1871. If J.D. Hooker was incommoded by its contemporaneous publication with his *Handbook of the New Zealand Flora* (1864), there is no evidence for it.

In this paper the mid-19th century contribution by Mueller to the taxonomy of the New Zealand flora is assessed through a comparison of his treatment of Chatham Islands plants with that of the late 20th century. My conclusion is that *Vegetation* is a competent work from which only those essential elements of nomenclature have been drawn.

### **Travers, The Chatham Islands flora, and Mueller**

Mr W.T.L. Travers (1819–1903), a former soldier who became a leading figure in science, law, and Government, sent many specimens to the Hookers at Kew from about 1854 onwards, evidenced from the many citations in Hooker's *Handbook of the New Zealand Flora* (1864, 1867); his only son, H.H. Travers, also collected specimens in mountainous areas (Buchanan 1872).

W.T.L. Travers resided in Christchurch from 1860 to 1869 during the local scientific ascendancy of German-born Julius Haast (1822–1887). Haast and Travers

were in close contact; Haast and Mueller had been in direct contact since 1859 (von Haast 1948). Haast promoted the idea of a Chatham Islands exploration and W.T.L. Travers financed it. H.H. Travers made the journey and collected the plants which W.T.L. Travers presented to the Phytological Museum of Melbourne.

Mueller already had an interest in the flora of the Chatham Islands because in 1858 he received as the result of "... temporary direct trade between Melbourne and the Chatham-Islands ..." plants from Anderson, and others through the offices of Dr I.E. Featherstone, Superintendent, Province of Wellington. As a direct result Mueller developed an interest in the Islands. On the receipt from A.J. Ralston, Melbourne, of some flowering and fruiting plants of the Chatham Islands endemic *Myosotidium hortensia*, an essay on "... that singular plant described as *Cynoglossum Chathamicum* was read before the Philosophical Institute of Victoria ..." (Mueller 1864, p. 2) but was never published because "... the venerable Sir Will. Hooker had given an account of the same plant". J.D. Hooker (1858) named it *Cynoglossum nobile*.

The scientific background against which H.H. Travers' Chatham Island specimens were sent to Mueller from the 1863 visit is easily described. At the time of Travers' visit William Colenso was the most reknowned resident collector and describer of indigenous plants; much he sent to Kew. W.T.L. Travers arrived in New Zealand in 1849, and from about 1854 became another among those botanists who sent specimens to the Herbarium at the Royal Botanic Gardens, Kew. When H.H. Travers went to the Chathams, scientific institutes did not exist in New Zealand. The Colonial Museum was founded in 1865, and J. Buchanan transferred from Dunedin to Wellington to join it. The Canterbury Museum, under J. Haast, was founded in 1865 at the same time as the Otago Museum. T.F. Cheeseman was appointed Secretary of the Auckland Institute and Curator of the Auckland Museum in 1874 following T. Kirk who held the position from 1868. None of these institutes was available to Travers until the time of his second trip of 1871.

The traditional home for the Travers' specimens would have been the Herbarium at Kew to which a set of specimens was sent as a donation to Sir William Hooker, and was used by J.D. Hooker for his *Handbook* (Nelson 1989). W.T.L. Travers presented the Chatham Island specimens to MEL (Mueller 1864, p. 3) but Nelson (1989) reported that H.H. Travers was the donor. The collection arrived at MEL around June 1864 for Mueller's attention (S. Maroske *in litt.*).

This interest in the plants of the Chatham Islands was expressed by Mueller in his letter of self-introduction to Haast (23 November 1859); he noted that the islands were botanically unexplored and wondered if someone could go there to study their natural history. By early 1862 (letter of 3 March to Haast) Mueller's ambitions were clear: (i) he wanted to prepare a sketch of the vegetation of the Chathams; (ii) he wanted to send a collector to the islands; (iii) he wanted exclusive use of any specimens ("Für die Arbeit möchte ich gern die Materialien Monopol besitzen"); (iv) he wanted to read a paper to the Philosophical Society for which the vegetation of the islands would provide a splendid theme.

On Haast's intimation to J.D. Hooker that Mueller was going to prepare an account of the Chatham Islands plants Hooker expressed the fervent hope that Mueller would not do so for reasons outlined below (J.D. Hooker *in H.F. von Haast 1948*). In the event, the *Vegetation* was published in 1864.

### William Thomas Locke Travers and Henry Hammersley Travers

There should be no room for confusion over the two Travers, father and son, and the Chatham Island collections. Yet there is. It is clear from Mueller (1864, p. 3) that

H.H. Travers went to the Chathams in 1863. Confirmation is in H.H. Travers (1869) where his departure is "... 12th of October last", on the schooner "Cecilia".

Nevertheless it is twice asserted that W.T.L. Travers visited the Islands (Given and Williams 1985; Given 1996), and to add to the confusion Hooker in his *Handbook of the New Zealand Flora, Part II* (1867, p. 722) cites "Mr W. Travers' collections" as the basis for Mueller's *Vegetation*. Further, or perhaps worse, throughout pp. 722–750 of the *Handbook*, "Chatham Island, W. Travers" occurs about 80 times. Buchanan (1875) unhelpfully gives the date of H.H. Travers' first trip as 1866, and W.T.L. Travers (in Travers, H.H. and Travers, W.L.T. 1873) as 1867.

That W.T.L. Travers accepted Haast's concept of a Chatham Islands exploration was consistent with his broad intellectual ambitions for New Zealand science. Today the Travers Chatham Island specimens are in MEL and K. They are also in WELT, and H.F. von Haast (1948) in an entry in the index to his father's biography, but unlocatable in the text of his book, indicated that the 1863 Chatham Island specimens were presented by W.T.L. Travers, Christchurch, to the recently founded Colonial Museum in Wellington.

### Date of publication of The Vegetation

Mueller's preface is dated 15 September 1864 and the volume was published before 10 October of that year (N.G. Walsh *in litt.*); the edition comprised 522 copies (S. Maroske *in litt.*). The publisher is given as Government Printer, Melbourne, but von Haast (1948, p. 250) leaves the impression that W.T.L. Travers paid for the publication as well as for the expedition. Hooker's *Handbook of the New Zealand Flora Part I* was published September to October 1864, and thus its contents were unavailable to Mueller. The effect is minimal: see *Cyathodes robusta*, *Tetragonia trigyna* for names given priority over trinomials in Mueller.

The title of Mueller's book is interesting; it does not describe the vegetation of the Chatham Islands in the way Cockayne (1902) did forty years later. It is a "Flora of the Chatham Islands". Mueller, reporting as he does those plants typical of the sand dunes, the volcanic cones, the coastal and lowland forests, the limestone habitats, and the peat, accounts in a non-ecological way for the vegetation of the Chatham Islands as revealed to him by H.H. Travers' collections, notes, and diary - the diary since destroyed.

### The "Enumeration"

Mueller in flora style listed the Chatham Island plants by family, genus, and species under the major subtitle "The Enumeration of the Plants of the Chatham-Islands". He listed 87 species in 67 genera, by his own reckoning, in what he later referred to as my "Sketch" (Mueller 1873). These taxa can be examined in several ways but I choose to examine them as listed by Mueller, give their current status, and draw conclusions from the comparison of 1864 and 1997 interpretations. Authorities for binomials are in Tables 1 and 2 unless essential to the discussion. Nomenclature for New Zealand taxa follows Allan (1961), Moore and Edgar (1970), and Connor and Edgar (1987) unless otherwise stated. There are five groups.

#### (i) Taxa described as new by Mueller

Mueller described eight species of flowering plants as new to botany, and five new varieties of established species; six pteridophytes were given status in new combinations. These and their current taxonomic status are in Table 1.

Almost all are endemic taxa currently (a) accepted unchanged e.g. *Leptinella featherstonii* and *Myrsine chathamica*; (b) transferred to different genera e.g. *Eurybia traversii* in *Olearia*, and *Senecio huntii* in *Brachyglottis*; (c) accepted at different taxonomic levels e.g. *Hymenanthera latifolia* var. *chathamica* as *Melicytus chathamicus*; (d) or instantly transferred by Hooker (1867), as in *Gingidium traversii* to *Aciphylla*. None of the pteridophytes is endemic.

Hooker's simultaneous publication in the *Handbook* (1864) of a name unknown to Mueller resulted in *Tetragonia trigyna* predating *T. implexicoma* var. *chathamica* and the loss of status as an endemic taxon.

Mueller was expansive on *Leptinella* (Veg. Chatham-Is. pp. 27–30) associating *L. potentillina* with 10 other species whose characteristics are set out simply. Though displaying hesitation over the remarkable habit of *L. featherstonii* which, had it not been clearly a species of *Leptinella*, he was prepared to have awarded generic recognition as *Traversia* with a clearly implied commemoration for H.H. Travers. Had that transpired an immediate conflict would have arisen with Hooker's *Traversia* of 1864 which commemorated W.T.L. Travers. Any doubt as to which Travers was being commemorated in *Eurybia traversii* was removed by Mueller's economic commemoration of both W.T.L. and H.H. Travers in the one taxon.

In general Mueller's taxonomic perceptions were accurate, and not unexpectedly the generic disposition of some taxa differs from current practice.

### (ii) Currently accepted names from Mueller's synonymy

As has been remarked upon by all commentators, Mueller included many binomials in synonymy — 15 species of *Epilobium* in *E. tetragonum*; nine species in *Gentiana saxosa* with the observation that "It is evident that the number of described Gentianae must be largely reduced" (p. 41). Seventeen names have been reinstated in the Chatham's flora; these are listed in Table 1 as "in synonymy of ..." together with the name used by Mueller. *Epilobium* is a simple case; six taxa, all with Travers' specimens at MEL, were recognized by Raven and Raven (1976) to replace the single entry "*E. tetragonum*". For the rest, apart from nomenclatural synonymy (*Sophora-Edwardsia*, *Deschampsia-Aira*, *Paesia-Pteris*), most changes are simple ones, e.g., *Calystegia soldanella* for *C. sepium*.

From the *Veronica* mélange of 22 names submerged under the invalid binomial *V. forsteri*, the endemic *Hebe dieffenbachii* has been restored; other species of *Hebe* now recognized were described later, of which two are endemic: *H. barkeri* and *H. chathamica* (Table 2).

The endemic *Olearia semidentata* was restored from Mueller's transfer to *Eurybia*.

### (iii) Taxa listed by Mueller under names not currently accepted

Another suite of names for native plants has replaced those used by Mueller in 1864. Eleven of them are pteridophytes; Brownsey *et al.* (1985) are clear on the current names for ferns and lycopods to replace those in Mueller by citing his *Vegetation* in 12 separate entries. Such assurance does not extend to all groups.

All names are listed in Table 1 together with the dates for the new or corrected post-*Vegetation* names. Some entries are simple ones — *Coriaria arborea* as the name of an indigenous species to replace *C. ruscifolia*;

*Urtica australis* for *U. incisa*. Five grasses received full notes, and under *Festuca littoralis* (Veg. Chatham-Is. 59) Mueller treated *Festuca* as he saw it, distributed across generous areas of Australia, and in which he included species of *Triodia*.

Entries in this class are distinguished in Table 1 as c.g. ‘*Libertia peregrinans* Cockayne and Allan 1926; as *L. ixoides* Sprengel (Veg. Chatham-Is. 53).’

It is possible to associate current names with all taxa listed in Mueller except for *Avicennia officinalis* collected by E. Dieffenbach (Veg. Chatham-Is. 75); Mueller’s final note “*Eurybia [Olearia] traversii* in a flowerless state bears considerable resemblance to *Avicennia officinalis*” may be significant. No one has commented since, and *A. resinifera* is unknown there.

**(iv) Taxa listed by Mueller under names currently accepted**

Nineteen names still in current use were correctly used by Mueller for native plants. These in Table 1 are simple and direct entries e.g. *Calystegia sepium* R.Br. (Veg. Chatham-Is. 38); *Lobelia anceps* Thunb. (Veg. Chatham-Is. 31); *Solanum aviculare* G. Forst. (Veg. Chatham-Is. 31); two are naturalized species. None of them is significant except perhaps *Euphorbia glauca* which is based on a specimen lost by H.H. Travers. Five are pteridophytes, four monocotyledons, four are trees or shrubs. On the whole it is an undistinguished list.

The discussion arising from the notes on Chatham Island specimens of circum- Antarctic *Samolus repens* (Veg. Chatham-Is. 34-36) extends to commentaries on other taxa, and the fuller and new diagnosis for *Samolus valerandii* L., a plant he acknowledges as unknown in the New Zealand Botanical Region. In much the same way under the name of *Chiloglottis traversii* (Veg. Chatham-Is. 51) the expanded discussion includes a full description of the Victorian orchid *C. gunnii* Lindl. which he thought might be better treated as var. *viridiflora*. Mueller wrote digressively and as the Spirit moved him even to the point of recording Haast’s gathering of *Phragmites australis* (*Arundo phragmites*) from the Grey River, Westland, as a native species, the first record of this plant in New Zealand.

**(v) Taxa included by Mueller in widespread New Zealand taxa but recognized since 1864 as endemic**

Among taxa discussed by Mueller as New Zealand-based indigenous plants, eleven have, since 1864, been segregated as Chatham Island endemics. In *Corokia* and *Pseudopanax* Kirk discerned new endemic species among those placed by Mueller in taxa of New Zealand-wide distribution.

Among these 11 entries the most dramatic is *Embergeria* — one of only two endemic genera of the Chathams. Its one species *E. grandiflora* is *Sonchus oleraceus* of the *Vegetation* (p. 31) = *S. grandiflora* Kirk. *Embergeria*, a genus distinct from *Sonchus* was erected by Boulos (1965); since its lectotypification by Lander (1976) it is treated as monotypic. It is not on the Snares Islands as Cheeseman (1880) stated.

In *Gentiana* Mueller advocated *G. saxosa* as a collective name for several described species (Veg. Chatham-Is. 40), but Cheeseman (1906) advanced the cause of the Chatham Island gentian in H.H. Travers’ collection giving it an eponymous epithet.

Several species are the sole representative of their genus on the Chatham Islands viz. *Astelia chathamica*, *Corokia macrocarpa*, *Cortaderia turbaria*, *Gentiana chathamica* [*Chionogenetias*], *Pseudopanax chathamicus*.

*Geranium traversii* Hook. f. was described from one small plant after Travers' specimens arrived at Kew; Mueller had included it in *G. dissectum* (Veg. Chatham-Is. 10).

Mueller could not have known that *Cyathodes acerosa* var. *latifolia* Hook. f. (Veg. Chatham-Is. 42) had a new name at species level as *C. robusta* in Hooker's *Handbook* (1864). Nor does it seem secure in *Cyathodes* which Weiller (1996a, b) restricts to Tasmania. *Cyathodes parviflora* has a curiously disjunct distribution — North Cape and Chatham Islands (Allan 1961) — which demands attention. *Dracophyllum arboreum* was distinguished from *D. scoparium* (Veg. Chatham-Is. 50) by Cockayne (1902); Wardle (1987) reduced *D. palmosum* Cockayne, described in 1902 as an endemic, to synonymy in *D. scoparium*, a proposition Cockayne himself thought possible.

These taxa are in Table 1 in the form *Corokia macrocarpa* Kirk 1899; *C. buddleioides* A. Cunn. (Veg. Chatham-Is. 16); **endemic**.

### Endemic Taxa not listed by Mueller and described since 1864

I include a short list of endemics described since Travers' 1863 collections were examined by Mueller. I do so only to allow a check on island endemics, a topic considerably capturing biologists' imagination (Barrett 1996; Bramwell 1979). Mueller had newly described 12 endemic taxa, of which *Tetragonia implexicoma* var. *chathamica* and *Polypodium scandens* var. *billardierei* are no longer regarded as such.

Some few endemic taxa, unrelated to Mueller's interpretation of H.H. Travers' specimens, have been described in the last 135 years (Table 2). Some like *Olearia seudentata* var. *albiflora* Dorrien Smith, *O. chathamica* var. *dendyi* Cockayne, and *Juncus planifolius* var. *chathamicus* Buch., have not stood up to later scrutiny being submerged in their superior taxa. *Linum monogynum* var. *chathamicum* Cockayne is upheld as an endemic by Given (1996) but not by Allan (1961).

*Disphylla papillatum* Chinnock (1971) was based on specimens collected particularly by N. Simpson, Travers having lost his specimens, which included the widespread *D. anstrale*, to mildew. No blame can attach to Mueller. The remaining taxa are run of the mill — two species of *Hebe* accepted from four described by Cockayne, Buchanan, and Kirk in *Veronica*. *Festuca coxii* of coastal cliffs, and *Poa chathamica* of coastal rocks and inland dunes and peat, resulted from Cockayne's collections with F.A.D. Cox; Petrie (1902) who described both, at first placed *F. coxii* in *Agropyron*, a not unsurprising mistake.

The sole endemic fern, *Asplenium chathamense*, has since been described from among many recent specimens (Brownsey 1985), although it is thought that there are unnamed endemic species in *Polystichum* (Brownsey *et al.* 1985; Given 1996).

Two plants considered worthy of recognition are listed by Given (1996), viz. *Craspedia* "Chatham", and *Utricularia* "Southern Tablelands minute". Both await taxonomic attention.

The only serious omission from Mueller's list is *Sporadanthus traversii* (F. Muell.) Kirk; Dieffenbach had collected specimens in 1840 but Travers did not gather it in 1863 from its water-saturated habitat. Further material led Mueller (1874) to recognize the new restionaceous genus *Sporadanthus*, once thought endemic to the Chathams but known now in North Island peat bogs (Cheeseman 1880).

The mode of declaration of the new genus was unorthodox. In a letter to Dr James Hector, an extract of which was printed in the Proceedings of the New Zealand Institute, and not in the Transactions, Mueller wrote "... I have deemed it best to form a separate genus for the Chatham Island plant, and have named it *Sporadanthus*". He asked Hector to publish it. Fortunately for nomenclature he gave his earlier name — *Lepyrodia traversii* F. Muell.

### Travers' Second Exploration 1871

H.H. Travers' second Chatham Islands' botanical exploration, this time sponsored by the Colonial Museum, began in July 1871 (Travers, W.T.L., 1872). The outcome was such that Hector (1873) could report that ten sets of H.H. Travers' specimens of "An almost exhaustive collection of the botany of the Chatham Islands ... will be available for exchange as soon as they have been reported on by Baron von Mueller, to whom a complete set has been sent in duplicate for this purpose".

Based on these specimens Mueller (1873) increased the number of genera present on the islands from 67 to 123 (almost double) and the number of species from 87 to 183 (more than double). These were distributed among (i) dicotyledons, 72 genera 94 species; (ii) monocotyledons, 34 genera, 52 species; (iii) ferns and allies, 17 genera 37 species; the genera were listed but not the species. Buchanan (1875) enumerating the taxa represented in H.H. Travers' specimens in the Colonial Museum, Wellington, which incorporated most of the genera in Mueller's second list, gave totals of 109 dicotyledonous species, 49 species of monocotyledons, and 47 species of ferns and allies, among which *Veronica chathamica* alone was described as new, and *Senecio radiolatus* reduced to varietal rank in *S. laetus*.

These large differences between the *Vegetation* and the outcome of the Travers' second trip indicate that the second collections greatly exceeded the first, not that Mueller was considerably selective in what he wrote up for the *Vegetation*.

There is room for discontent, however, over Mueller's failure to provide what Buchanan (1875) described as the "... complete analytical list of the whole", Hector (1873) having made it clear that specimens from Travers' 1871 journey had been sent to Mueller for that express purpose.

### The "Enumeration" And Its Responses

Mueller's grasp of the taxonomy of the plants of the Chatham Islands that Travers had gathered was rapid, efficient, and highly successful. That the *Vegetation* with illustrations — seven plates with 89 individual drawings by F. Schönfeld — was published just more than a year after Travers set out on his exploration, and about five months after the specimens arrived at MEL, vouches for diligent application beyond modern expectation. The work was further characterized by the long lists of cited usages of species names and, especially, by long lists of synonyms for some taxa confirming his view that too many species had been described in the past. The ultimate was the much commented synonymy in *Veronica forsteri* nom. nov. The extent to which comparisons were made with related Australian taxa was uncharacteristic of treatment of New Zealand plants, then or perhaps since. Further, Mueller made extensive use of the collectors' field notes and diary, perhaps to compensate for never having been to the Islands, to complement his formal descriptions.

Hooker had written to Haast in 1864 of his hope "... that Mueller will not publish Travers' Chatham Island plants. He is so reckless and careless — he is an excellent, most assiduous, marvellous man, but craves to have *F. Muell.* after every name, and has loaded the Australian flora with endless synonyms, examining in

haste, describing with the utmost carelessness, and causing no end of trouble to his unlucky brother botanists. I tell him plainly that he is ruining his reputation, but nothing will stop him. He has made chaos of Australian botany." (J.D. Hooker to J. Haast 1864, in H.F. von Haast 1948). The implied risk was for New Zealand botany. That was in private correspondence. In public, by contrast, Hooker courteously wrote (1867, p. 722) "Two valuable contributions to New Zealand botany have been published since the first part of this Handbook appeared ....; the other is Dr Mueller's work 'On the Vegetation of Chatham Islands', founded chiefly on Mr W. (sic) Travers' collections". In Part II of the Handbook, Hooker under "Additions, Corrections, etc." acknowledged Mueller's *Vegetation* in entries such as those under *Hymenanthera crassifolia* (p. 724), *Colobanthus billardierei* (p.725), *Geranium traversii* n.sp. (p. 726), *Ligusticum dieffenbachii* (p. 729), *Olearia traversii* (p. 731), and *Cotula featherstonii* (p. 733).

Cockayne (1902), writing after his 1901 visit to the Islands, noted that Mueller provided descriptions or notes on 129 species of phanerogams and 25 species of ferns and lycopods. Cockayne's criticism was of the small number of species detected by Mueller, but by that time he had his own data and those from both of H.H. Travers' collections on which to base his opinion, aided by Buchanan (1875). Mueller with c.100 specimens of ferns and higher plants was not as well supplied in 1864.

Cheeseman (1906) wrote of the *Vegetation* that it was "... an important addition to the botanical literature of the colony ..." but that "... New Zealand botanists entirely repudiate the peculiar views entertained by the author respecting the circumscription of many of the species". Those botanists are unnamed but clearly included Cockayne, Darwinian in outlook, who had blamed Mueller's belief in the fixity of species which resulted in a restricted number of taxa. Mueller (1864, p. 8) seems to have been Linnaean in the sense expressed in the *Philosophia Botanica* "*Species tot numeramus quot diversae formae in principio sunt creatae*". Mueller's attitude to the "... theory of transmutation ..." is clear in his Annual Report of the Government Botanist and Director of the Botanic Garden Melbourne, 1865. There, writing explicitly of the *Vegetation* he stated that "... in the treatise under consideration I have expressed though cursory still unequivocally a dissenting opinion." Mueller there also complained that taxonomists, through their lack of extensive field studies, vainly attempted "... to draw lines of specific demarcation between mere varieties or races, ..." (shades of a later Cockayne dictum). Mueller used the *Vegetation* as an anti-Darwinian polemic.

Without denying Cheeseman's (1906) opinion of the "peculiar views" in the well discussed and almost incredible *Veronica forsteri* episode, or of *Epilobium tetragonum* from which six taxa are now recognized, but denying his opinion that it applied to "many species", my own conclusion is that Mueller, under the heading "Enumeration of the Plants of the Chatham-Islands", presented a competent work in botanical science although written in an eclectic style, illustrated with seven plates, and extensive in its notes and appreciations compared with the style of his contemporary J.D. Hooker. The eight new endemic species he described have stood the test of time, and 130 years later their number is not much increased. The concordant historic usages of names were present, the synonymy apparent, and the ecology carefully attributed to H.H. Travers together with the use of his notes on habit and form. Nowhere do I find for these Chatham Island taxa evidence of loading the "... flora with endless synonyms" or describing with "utmost carelessness" (J.D. Hooker 1864 in H.F. von Haast 1948). Quite the opposite to judge from the consequences. My difficulties lie in the Teutonic diction and the problems it generates, the curious and often unrelated digressions, and the fulsome dedication to Irish-born W.T.L. Travers where the "utmost carelessness" lies in the attribution to Travers of a Judgeship of the Supreme Court whereas he had been a District Court Judge before entering politics.

Hooker (1867), despite an earlier unease expressed to Haast, immediately used the *Vegetation* to the benefit of New Zealand taxonomic botany. Mueller, who expected that his views and Hooker's on the Chatham Islands flora would "... in many instances ..." coincide (*Vegetation* p. 4), was justified. The exceptions are evident. In a letter to Haast (24 October 1864) just after the publication of the *Vegetation*, Mueller remarked that more effort was invested in his small book that was apparent at a first glance. *Vero!*

Apart from its essential taxonomic and nomenclatural uses Mueller's *Vegetation* has not earned the significant reputation in New Zealand that I believe it merits.

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The late Dr J.H. Willis of MEL introduced me to Baron von Mueller during my first visit to the Herbarium in 1951; my interest reflects the enthusiasm he displayed then. I was pleased to take part in "The Scientific Savant in 19th Century Australia" at the University of Melbourne in September 1996 with the life, times, and legacy of Ferdinand von Mueller as the central theme. That no mention was made of his *Vegetation of the Chatham-Islands* has prompted this appreciation.

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**Table 1: Chatham Island taxa in Mueller's "Enumeration"; current name listed first.**

**Dicotyledons**

*Aciphylla dieffenbachii* (F. Muell.) Kirk 1899; as *Gingidiump dieffenbachii* F. Muell. (Veg. Chatham-Is. Chatham-Is. 17, t.1); **endemic**.

*A. traversii* (F. Muell.) Hook. f. 1867; as *Gingidiump traversii* F. Muell. (Veg. Chatham-Is. 18); **endemic**.

*Avicennia officinalis* L. (Veg. Chatham-Is. 75); leg. E. Dieffenbach; unknown on Chatham Islands.

*Brachyglottis huntii* (F. Muell.) Nordenstam 1978; as *Sencio huntii* F. Muell. (Veg. Chatham-Is. 23, t.3); **endemic**.

*Calystegia sepium* R.Br. (Veg. Chatham-Is. 38).

*C. soldanella* R.Br.; in synonymy of *C. sepium*.

*C. tuguriorum* (G. Forst.) Hook. f.; in synonymy of *C. sepium*.

*Colobanthus muelleri* Kirk 1895; as *Colobanthus billardierei* var. *bachypoda* F. Muell. (Veg. Chatham-Is. 11).

*Coprosma* sp. (Veg. Chatham-Is. 18) "... two species most probably of this genus ..." Under *C. propinqua* A. Cunn. leg. Dieffenbach, Mueller stated "Probably one of the species found by Mr Travers is referable to this plant" (Veg. Chatham-Is. 75). *C. propinqua* var. *martinii* W.R.B. Oliver is **endemic**.

*Coriaria arborea* Lindsay 1868; as *C. ruscifolia* L. (Veg. Chatham-Is. 11)

*Corokia macrocarpa* Kirk 1899; as *C. buddleoides* A. Cunn. (Veg. Chatham-Is. 16); **endemic**.

*Corynocarpus laevigatus* J.R. & G. Forst. (Veg. Chatham-Is. 14).

*Cyathodes robusta* Hook. f. 1864; as *C. acerosa* var. *latifolia* Hook f. (Veg. Chatham-Is. 43), leg. Capt. Anderson; **endemic**.

*C. parviflora* (Andr.) Allan 1961; as *Lenycopogon richei* R.Br. (Veg. Chatham-Is. 45).

*Disiphyna papillatum* Chinnock 1971; Mueller (Veg. Chatham-Is. 13) refers to specimens of *Mesembryanthemum* which Travers had lost; **endemic**; *D. australe* (Aiton) N.E. Br. is present (Chinnock 1971).

*Dracophyllum scoparium* Hook. f. (Veg. Chatham-Is. 42); including *D. paedosum* Cockayne 1902.

*Embergeria grandifolia* (Kirk) Boulos 1965; as *Sonchus oleraceus* L. (Veg. Chatham-Is. 31); **endemic**.

*Epilobium alsinoides* ssp. *atricapitifolium* (A. Cunn.) Raven & Engelhorn 1971; in synonymy of *E. tetragonum* L. (Veg. Chatham-Is. 15) together with the four following taxa.

*E. billardierianum* Sér. ssp. *billardierianum*.

*E. billardierianum* ssp. *cinereum* (A. Rich.) Raven & Engelhorn 1971.

*E. pallidiflorum* A. Cunn.

*E. pubens* A. Rich.

*E. rotundifolium* G. Forst.

*Euphorbia glauca* G. Forst. (Veg. Chatham-Is. 17) "A plant of this genus was observed in the Chatham-Islands by Mr Travers. It is most likely *Euphorbia glauca* ..."; specimen lost through mildew according to Travers (1869).

*Gentiana chathamica* Cheeseman 1906 as *G. saxosa* G. Forst. (Veg. Chatham-Is. 40); **endemic**.

*Geranium traversii* var. *elegans* Cockayne 1867; as *G. dissectum* L. (Veg. Chatham-Is. 10); **endemic**.

*Hebe dieffenbachii* (Benth.) Cockayne & Allan 1926; included in *V. forsteri* F. Muell. (Veg. Chatham-Is. 45) as a synonym; leg. E. Dieffenbach, **endemic**.

*Leptinella featherstonii* F. Muell. (Veg. Chatham-Is. 27, t.5); **endemic**.

*L. potentillina* F. Muell. (Veg. Chatham-Is. 28 t.6).

*Linum monogynum* G. Forst. (Veg. Chatham-Is. 10).

*Lobelia anceps* Thunb. (Veg. Chatham-Is. 31).

*Macropiper exselsum* (G. Forst.) Miquel subsp. *excelsum* (Veg. Chatham-Is. 48).

*Melicytus chathamicus* (F. Muell.) Garn.-Jones 1988; as *Hymenanthera latifolia* var. *chathamica* F. Muell. (Veg. Chatham-Is. 9); **endemic**.

*Muehlenbeckia australis* (G. Forst.) Meissner (Veg. Chatham-Is. 50).

*Myosotidium hortensia* (Decne) Baill. 1891; as *M. nobile* Hook. (Veg. Chatham-Is. 32); **endemic**.

*Myrsine chathamica* F. Muell. (Veg. Chatham-Is. 38, t.7); **endemic**.

*Myoporum laetum* G. Forst. (Veg. Chatham-Is. 32).

*Olearia chathamica* Kirk 1891; Mueller as "...evidently allied to *Eurybia* [*Olearia*] *operina*" (Veg. Chatham-Is. 22); **endemic**.

*O. semidentata* Hook. f.; as *Eurybia semidentata* (Decne) F. Muell. (Veg. Chatham-Is. 21); **endemic**.

*O. traversii* (F. Muell.) Hook. f. 1867; as *Eurybia traversii* F. Muell. (Veg. Chatham-Is. 19, t.2); **endemic**.

*Pimelea arenaria* A. Cunn. (Veg. Chatham-Is. 48).

*Plagianthus regius* var. *chathamicus* Cockayne 1912; as *P. betulinus* A. Cunn. (Veg. Chatham-Is. 10); **endemic**.

*Polygonum decipiens* R.Br.; in synonymy of *P. miums* Huds. (Veg. Chatham-Is. 49).

*Potentilla anserinaoides* Raoul; in synonymy of *P. anserina* L. (Veg. Chatham-Is. 14).

*Pseudopanax chathamicus* Kirk 1899; as *Hedera crassifolia* A. Gray (Veg. Chatham-Is. 75); leg. E. Dieffenbach; **endemic**.

*Samolus repens* (J.R. & G. Forst.) Pers. (Veg. Chatham-Is. 34).

*Senecio radiolatus* F. Muell. ssp. *radiolatus* (Veg. Chatham-Is. 24, t.4); **endemic**.

*Sophora microphylla* Art.; in synonymy of *Edwardsia grandiflora* Salisb. (Veg. Chatham-Is. 13). Specimens lost (Travers 1869).

*Solanum aviculare* G. Forst. (Veg. Chatham-Is. 31).

*Taraxacum officinale* Weber (Veg. Chatham-Is. 30); introduced.

*Tetragonia trigyna* Hook. f. 1864; as *T. implexicoma* var. *chathamica* F. Muell. (Veg. Chatham-Is. 12).

*Urtica australis* Hook. f.; as *U. incisa* Poir. (Veg. Chatham-Is. 47).

### Monocotyledons

*Aporostylis bifolia* (Hook. f.) Rupp & Hatch 1946; as *Chiloglottis traversii* F. Muell. nom. nov. pro *Caladenia bifolia* Hook. f. (Veg. Chatham-Is. 51).

*Astelia chathaniaca* (Skottsb.) L.B. Moore 1966; as *A. banksii* A. Cunn. (Veg. Chatham-Is. 54); **endemic**.

*Austrostipa littoralis* (Labill.) E. Aleks 1976; as *Festuca littoralis* Labill. (Veg. Chatham-Is. 59).

*Carex sectoides* (Kirk) Edgar 1970; as *C. paniculata* L. (Veg. Chatham-Is. 57).

*C. ventosa* C.B. Clarke 1906; as *C. forsteri* Wahl. (Veg. Chatham-Is. 58); **endemic**.

*Cortaderia turbaria* Connor 1987; as *Arundo conspicua* G. Forst. (Veg. Chatham-Is. 61); **endemic**.

*Demoschoenus spiralis* (A. Rich.) Hook. f. (Veg. Chatham-Is. 57).

*Deschampsia caespitosa* (L.) Beauv.; in synonymy of *Aira caespitosa* L. (Veg. Chatham-Is. 61).

*Earina mucronata* Lindl. (Veg. Chatham-Is. 50).

*Eleocharis acuta* R.Br.

*E. gracilis* R.Br.; in synonymy of *Heleocharis pahustris* R.Br. (Veg. Chatham-Is. 56).

*Holcus lanatus* L. (Veg. Chatham-Is. 61); naturalized.

*Juncus planifolius* R.Br. (Veg. Chatham-Is. 56).

*Lachnagrostis filiformis* (G. Forst.) Trin.; in synonymy of *Agrostis solandri* F. Muell. (Veg. Chatham-Is. 60).

*Liberia peregrinans* Cockayne & Allan 1926; as *L. ixoides* Sprengel (Veg. Chatham-Is. 53).

*Luzula banksiana* var. *acra* Edgar 1966; in synonymy of *L. campestris* DC. (Veg. Chatham-Is. 55).

*Phormium tenax* J.R. & G. Forst. (Veg. Chatham-Is. 54); referred to as *P. aff. tenax* "Chathams" by Given (1996); **endemic**.

*Pterostylis banksii* var. *silvicultrix* F. Muell. (Veg. Chatham-Is. 51); **endemic**.

*Rhipogonum scandens* J.R. & G. Forst. (Veg. Chatham-Is. 54).

*Rhopalostylis sapida* Wendle & Drude 1878; as *Areca sapida* G. Forst. (Veg. Chatham-Is. 55); Cockayne (1902) emphatically stated that these plants are not *R. sapida*; Given (1996) refers them to *Rhopalostylis* "Chatham" and **endemic**.

### Pteridophytes

\* *Adiantum cunninghamii* Hook.; as *A. formosum* var. *cunninghamii* (Hook.) F. Muell. (Veg. Chatham-Is. 72).

\* *Asplenium bulbiferum* G. Forst. ssp. *bulbiferum*; as *A. marinum* var. *bulbifera* (G. Forst.) F. Muell. (Veg. Chatham-Is. 66).

\* *A. flaccidum* G. Forst. ssp. *flaccidum*; as *A. marinum* var. *flaccida* (G. Forst.) F. Muell. (Veg. Chatham-Is. 67).

\* *A. obtusatum* G. Forst. ssp. *obtusatum*; as *A. marinum* var. *obtusata* (G. Forst.) F. Muell. (Veg. Chatham-Is. 66).

*A. polyodon* G. Forst.; in synonymy of *A. falcatum* Lam. (Veg. Chatham-Is. 65).

*Blechnum* sp. (*B. capense* sensu Allan 1961); as *Lomaria capense* Willd. (Veg. Chatham-Is. 72).

*B. discolor* (G. Forst.) Keys. 1873; as *Lomaria discolor* (G. Forst.) Willd. (Veg. Chatham-Is. 71).

\* *Botrychium australe* R.Br.; in synonymy of *B. ternatum* Swartz (Veg. Chatham-Is. 63).

*Ctenopteris heterophylla* (Labill.) Tindale 1957; as *Polypodium gramunitidis* R.Br. (Veg. Chatham-Is. 68).

*Cyathea cunninghamii* Hook. f. (Veg. Chatham-Is. 65).  
*C. dealbata* (G. Forst.) Swartz (Veg. Chatham-Is. 65).  
*Dicksonia squarrosa* (G. Forst.) Swartz (Veg. Chatham-Is. 65).  
*Gleichenia microphylla* R.Br.; as *G. dicarpa* (Veg. Chatham-Is. 62).  
*Histiopteris incisa* (Thunb.) J. Smith 1875; as *Pteris incisa* Thunb. (Veg. Chatham-Is. 74); leg. Capt. Anderson.  
*Hymenophyllum demissum* (G. Forst.) Swartz (Veg. Chatham-Is. 64).  
\* *Hypolepis lactea* Brownsey & Chinnock 1984 p.p.  
\* *H. rufobarbata* (Col.) Wakef. 1956 p.p.; as *Polypodium rugosulum* Labill. (Veg. Chatham-Is. 68).  
\* *Lastreopsis microsora* ssp. *pentangularis* (Col.) Tindale 1965; as *Nephrodium decompositum* R.Br. (Veg. Chatham-Is. 69).  
*Lycopodium deuterodensum* Herter 1949; as *L. densum* Labill. (Veg. Chatham-Is. 62); leg. E. Dieffenbach.  
\* *L. varium* R.Br.; as *L. selago* var. *flagellaria* (A. Rich.) F. Muell. (Veg. Chatham-Is. 62); "requires further study" (Brownsey *et al.* 1985).  
*L. volubile* G. Forst. (Veg. Chatham-Is. 62).  
*Paesia scaberula* (A. Rich.) Kuhn; in synonymy of *Pteris scaberula* A. Rich. (Veg. Chatham-Is. 73).  
\* *Phymatosorus pustulatus* (G. Forst.) Large, Braggins & P.S. Green 1992; as *Polypodium scandens* var. *billardieriei* (R.Br.) F. Muell. (Veg. Chatham-Is. 69).  
*Pneumatopteris pennigera* (G. Forst.) Holttum 1973; as *Polypodium pennigerum* G. Forst. (Veg. Chatham-Is. 68).  
\* *Polystichum vestitum* (G. Forst.) C. Presl; as *Aspidium aculeatum* Swartz (Veg. Chatham-Is. 70).  
\* *Pteridium esculentum* (G. Forst.) Cockayne 1908; as *Pteris aquilina* L. (Veg. Chatham-Is. 73); leg. Capt. Anderson.  
*Rimohra adiantiformis* (G. Forst.) Ching 1934; as *Aspidium coriaceum* Swartz (Veg. Chatham-Is. 70).  
*Trichomanes venosum* R.Br. (Veg. Chatham-Is. 64).  
\* Particularly mentioned in Brownsey *et al.* (1985).

**Table 2. Endemic Chatham Islands taxa described from later collections and currently accepted**

*Asplenium chathamense* Brownsey  
*Callitriche petriei* ssp. *chathamica* R. Mason  
*Carex chathamica* Petrie  
*Coprosma chathamica* Cockayne  
*Disphyma papillatum* Chinnock; Mueller (Veg. Chatham-Is. 13) referred to specimens of *Mesembryanthemum* which Travers had lost.  
*Dracophyllum arboreum* Cockayne  
*Festuca coxii* (Petrie) Hack.  
*Hebe Barkeri* (Cockayne) Cockayne (includes *H. gigantea* (Cockayne) Cockayne & Allan).  
*H. chathamica* (Buchan.) Cockayne & Allan (includes *H. coxiana* (Kirk) Cockayne).  
*Olearia chathamica* Kirk 1891; *O. operina* Hook. f. "form with lax bracts on the scapes".  
Mueller (p. 22) discussed this taxon as "evidently allied to *Eurybia* [*Olearia*] *operina* ..."  
*Poa chathamica* Petrie